

129-4-12/12

All-Union Conference on industrial use of high frequency currents held in Leningrad.

currents". In this paper he outlined the most important trends in the use of high frequency heating between 1955 and 1957 dealing with surface hardening of components with complicated configurations; high speed gas carburisation using induction heating; heating right through of blanks for forging, stamping and rolling; development of apparatus for controlling heat treatment processes and automation and mechanisation in large batch and mass production. During the last three years the following technological processes have been developed which are based on induction heating:

1. Two-frequency "hardening" of the surface of toothed gears with average moduli. First, heating is effected with a frequency of 1000-2500 c.p.s. during which the heat is generated mainly at the bottom of the tooth gap and, following that, radio frequency is fed to the inductor for a duration of 0.5 to 0.3 sec for heating the tips of the teeth. Subsequent quenching permits obtaining a hardened layer which reproduces the shape of the teeth.
2. Gas case hardening of toothed gears using induction

Card 2/14 heating ensures a sharp increase of the speed of the

129-4-12/12

All-Union Conference on industrial use of high frequency currents held in Leningrad.

chemical-heat treatment and is used successfully in the automobile industry.

3. Hardening of the drilling bits for use in the oil industry.

4. "Bright" annealing of steel strip.

5. Two-frequency heating of steel blanks for heating by applying pressure, particularly for rolling.

6. Heating and hardening of leaf springs on automatic machines.

7. High speed tempering of hardened components using high frequency heating etc. For automating technological processes, the following are at present manufactured:

An automatic machine for heating and hardening of leaf springs; manipulator for horizontal forging machines; automatic machines for hardening of small components.

Of the new apparatus used in induction heating, the author mentioned a stabiliser of the temperature of components being heated, a photo-electric pyrometer with a direct reading off of the temperature, relay for dosing the energy, etc. Of particular interest were the data he gave on

Card 3/14 the two-frequency heating of gears. The entire process

129-4-12/12

All-Union Conference on industrial use of high frequency currents held in Leningrad.

takes only a few seconds and can be used in mass production for heat treatment of gears with average moduli. Heating of blanks which are to be shaped by applying pressure is also effected by two-frequency induction heating using 50 c.p.s. current for heating to 700-750°C followed by heating with high frequencies to 1100-1150°C. The two-frequency induction heating reduces the consumption of electricity in the case of heating right through of blanks. For tempering and annealing of weld joints, induction heating with 50 c.p.s. and with higher frequencies is used. The paper of M. G. Lozinskiy, Doctor of Technical Sciences, Institute of Engineering Technology, Ac.Sc. USSR (Institut Mashinovedeniya AN SSSR) dealt with the problems of strength of surface hardened components and the features of high frequency heating. The deformation detected by the author in engineering magnetic steels "45" and "40X" forms in the surface layer as a result of magnetostriction caused by the a.c. electromagnetic field of the inductor. On a smooth surface of blanks consisting of magnetic steels which were subjected to repeated cycles of heating and cooling, "mounds" and

Card 4/14

129-4-12/12
All-Union Conference on industrial use of high frequency currents
held in Leningrad.

"valleys" form at spacings equalling the half-wave of the supersonic oscillations generated by the high frequency. In non-magnetic steels no such phenomenon was observed. It was also observed that with increasing number of cycles, heating-cooling, the diameter of the cylindrical specimens in the heating zone increases, whilst the height of the specimens decreases. Furthermore, the author reported on the method of G. V. Uzhik which enables increasing the static strength up to 300%; this is achieved by using h.f. heating of a thin layer in the zone of stress concentrations at the surface of steel components. Thus, for instance, cylindrical specimens made of hardened 40X steels with a stress concentrator in the form of a notch will be 2.5 times stronger if the notch zone is tempered by using h.f. heating. M. G. Lozinskiy considers that use of the method of strengthening applying h.f. tempering of the stress concentration zones will permit evolving specifications which would justify more rational designs than those used hitherto.

K. Z. Shepelyakovskiy (ZIL) read the paper "On reducing
Card 5/14 the hardenability as a means of achieving contour (surface)

129-4-12/12

All-Union Conference on industrial use of high frequency currents held in Leningrad.

hardening of toothed gears of average moduli". For this purpose a steel with low hardenability, 3M 937 , was used. Gears made of this steel, of 180 mm dia. with a modulus of 4.2, were heated by means of an 8000 c.p.s. current of 100 kW capacity for a duration of 24 secs. The heating was effected in a ring-shaped inductor after which the gears were moved into a ring-shaped shower with a fixed direction of the holes. The teeth and the rims of the gears were subjected to hardening. The strength of the hardened teeth was investigated by loading until failure. In the case of gears made of the steel 30XCT (after carburisation and hardening) this load was 15.6 tons, for the steel 3M 937 the load was 16 tons. In the case of hardening of gears made of the steel 3M 937 , a minimum deformation occurs, the fluctuations along the pitch circle after hardening amounted to 0.01-0.02 mm. In some cases the contact strength should be increased by increasing the carbon content to 0.6-0.7%.

I. L. Glukhanov, V. N. Bogdanov, Ye. D. Makarova,
H.F. Scientific Research Institute imeni V.P. Vologdin
Card 6/14 (NII TVCh imeni V. P. Vologdina) presented a paper on

129-4-12/12

All-Union Conference on industrial use of high frequency currents held in Leningrad.

surface hardening of gears by induction heating with two frequencies. The method ensures heating along the contour of gears with moduli of 3.5 to 5. During heating with a lower frequency (1000 to 2000 c.p.s.), the bottom of the tooth gap is heated intensively, whilst at radio frequency (300 000 c.p.s.) the tip of the tooth is heated. The same inductor is used for both frequencies. The heating with the lower frequency lasts 2.5 to 4 secs; thereby, the specific power consumption is 1.5 to 1.7 kW/cm². Heating with the higher frequency is effected for 0.5 to 0.7 sec using a specific power of 1.1 to 1.2 kW/cm². The 1000 c.p.s. current is generated by a 500 kW rotary generator, whilst the 300 kc/sec current is generated with an oscillator circuit of 400 kW rating. During hardening of gears made of steel "45" cracks occur and, therefore, the carbon content was reduced and alloy steels 36Г2С, 35СГ etc. are being used. For fracturing a tool of a surface hardened gear a force of 9.5 to 17 tons is required, whilst the force required for fracturing case hardened gears after hardening, made of the steel 18ХГТ,

Card 7/14 did not exceed 10 tons per tooth. Gears produced by using

129-4-12/12

All-Union Conference on industrial use of high frequency currents held in Leningrad.

two-frequency hardening were done three times faster than gears produced according to the old technology. Therefore, in the further tests the steels 65Г, 50ХГ, 40ХН and 40ХНМА were used.

The paper of N. M. Rodigin, Ural Branch of the Ac.Sc. USSR (Ural'skiy Filial AN SSSR) was devoted to the new method of induction heating of steel strip. The novel feature consists in the fact that the electro-magnetic field produced by an alternating current is directed perpendicular to its surface and not in the longitudinal direction of the strip. This enables using economical sources of current of elevated frequency, namely, rotary generators. The required temperature distribution along the width of the strip is ensured by an appropriate configuration of the magnetic path and by an air gap between the poles. This method can be used for annealing cold rolled strip, for heating and for preheating of strip during rolling, pickling, deposition of coatings, etc.

V. N. Bogdanov and V. A. Pysakhevich reported on the practical application of the above method for annealing Card S/14 thin strip in the Leningrad Steel Rolling Mill (Leningradskiy

119-4-12.12

All-Union Conference on industrial use of high frequency currents held in Leningrad.

Staleprokatnyi Zavod). The optimum frequency depends on the thickness and the width of the strip. For a thickness of 0.2 to 0.6 mm and a width of 100 mm it is recommended to use a current of 8000 c.p.s.; for strip of 200 mm a current of 2500 c.p.s. and for a width of 400 mm a current of 1000 c.p.s. On heating strip to 700-900°C, the uniformity of the temperature along the breadth of the strip is $\pm 25^{\circ}\text{C}$. For heating, a two-turn inductor was used, whereby the conductors of the current and of the magnetic flux were water cooled. This method was applied in the case of bright annealing of cold rolled strip. For a speed of movement of the strip of 25 m/min the required power was 200 kW (for a frequency of 2500 c.p.s.). The productivity of the equipment equalled 1 ton/hr. The specific power consumption during induction heating is 180-190 kWh/ton. Compared with annealing in chamber furnaces, this method has a number of advantages since thereby the productivity per m² of production space is increased two to threefold, the annealing time is reduced by several hundred times, uniform mechanical properties are ensured along the entire length of the

Card 9/14

129-4-12/12

All-Union Conference on industrial use of high frequency currents held in Leningrad.

strip coil and welding together of the strip during annealing is prevented. The specific consumption of electricity is higher for induction heating than for electrical furnaces.

V. N. Gridnev, Doctor of Technical Sciences, **Kiyev** Polytechnical Institute (**Kiyevskiy** Politekhnicheskiy Institut) dealt with the influence of the speed of heating on the structure and the properties of steel. Apparatus was built for the investigations which enabled simultaneous recording of several physical parameters so that the following could be oscillographically recorded: temperature, change in the length of the specimen and in its electric resistance and also current intensity in the inductor. The recording was effected with a speed of 50 to 10 000°C/sec and the dilatometric curves were recorded with a speed of 60 000°C/sec. The following binary alloys were investigated - Fe-Cr (up to 8%); Fe-Si (up to 3%); Fe-Ti; Fe-W; the C content was about 0.02%. Steels containing 0.1; 0.45; 0.54; 0.77 and 1.12% C were also investigated. The author has established that during heating of annealed carbon-free alloys, the

Card 10/14

129---12/12

All-Union Conference on industrial use of high frequency currents held in Leningrad.

transformation temperature does not depend on the speed of heating and the magnitude of the volume effects depends on the composition of the alloy and the preceding heat treatment. When heating annealed iron-carbon alloys, the transformation temperature is determined by the speed of heating and by the initial structure. On heating hardened low alloy carbon-free alloys, the transformation temperature compared to that in the alloys in the annealed state does not change at all in some cases (Fe-Si; Fe-Ti), whilst in other cases it decreases by 30 to 40°C (Fe-Cr and Fe-W). On heating hardened steels, the dilatometric recordings show clearly the volume changes caused by the martensite decomposition and by the phase transformation; the decomposition cannot be suppressed not even at heating speeds of 60 000°C/sec. At high heating speeds of hardened steels, the phase transformation takes place in the range of 700°C, i.e. at lower temperatures than the transformation during slow heating. Investigations of the influence of the heating speed on the structure and properties of hardened, carbon and alloy steels in the case of electric tempering showed that at elevated

Card 11/14

129-4-12/12

All-Union Conference on industrial use of high frequency currents
held in Leningrad.

heating speeds a favourable combination can be obtained of the strength and ductility and also an increased resistance to wear which is of practical interest. In their paper I. N. Kidin, Doctor of Technical Sciences, and Yu. A. Bashnin, Moscow Institute of Steel (Moskovskiy Institut Stali) expressed the view that the higher the heating speed the larger will be the temperature range in which phase transformations will take place. Experimental data show that pearlite-austenite transformations proceed in the range of higher temperatures. In the case of high frequency hardening, higher temperatures are required than in the case of heating in an ordinary furnace. This is attributed to the fact that the phase transformations proceed with a higher speed due to the more rapid rise in the temperature and due to the sharp acceleration of the dissociation of carbides and the diffusion of carbon in the ferrite. The authors showed that it is justified to introduce a new thermal parameter, namely, the speed of induction heating in the range of phase transformations. This would enable the plotting of diagrams of preferential and permissible

Card 12/14

129-4-12/12

All-Union Conference on industrial use of high frequency currents held in Leningrad.

hardening regimes which would conserve the character of generally valid relations under conditions which are reproduceable in normal production.

V. P. Pleshachkova (TsNIITMASH) read an interesting paper on the deformation of surface hardened steel. H.F. surface hardening permits reducing the deformation of the steel. The author investigated the influence on the deformation of the following factors: heating temperature, cooling speed, depth of the hardened layer, structure of the starting material and also of the temperature and time of heating in the case of low temperature tempering. The results have shown that in the case of h.f. surface hardening of ring specimens with small height to diameter ratios (1:4; 1:7) produced from various steels, the deformation manifests itself in a decrease of the outside diameter and an increase in the height and in the inner diameter. An increase in the temperature leads to an increase in the deformation along the outside and inside diameters and manifests itself less on the height of the rings. The deformation of rings made of alloy steels

Card 13/14 is greater than for rings made of carbon steels under

129-4-12/12

All-Union Conference on industrial use of high frequency currents held in Leningrad.

equal conditions of heating and cooling. Cooling in a 30 to 35% solution of glycerine and a 5% solution of potassium permanganate brings about a reduction in the deformation and in the crack formation, particularly in the case of alloy steels (40X, 40XH). Tempering at 140 to 200°C reduces the dimensions as compared to the hardened state and thereby the changes in the dimensions of the height and the internal diameter are compensated but the changes of the external diameter are amplified. Increase of the tempering temperature brings about an increase of the deformation.

Representatives from Roumania and East Germany participated in the Conference. The German delegate, E. Trippmacher, reported on the designs of compact h.f. transformers with built-in magnetic paths produced in East Germany.

NOTE: This is a complete translation and not an abstract.

AVAILABLE: Library of Congress.

Card 14/14

113-58-7-15/25

AUTHOR: ~~Shepelyakovskiy, K.S., Candidate of Technical Sciences, and~~
~~Shklyarov, P.N.~~

TITLE: High-Speed Induction Heating of Rods in Automatic Upsetting Presses (Skorostnoy induktsionnyy nagrev shtang v avtomaticheskikh vysadochnykh pressakh)

PERIODICAL: Avtomobil'naya promyshlennost', 1958, Nr 7, pp 30-33 (USSR)

ABSTRACT: The author compares the advantages of contact and induction heating of rods in automatic upsetting presses, and favors the latter. The large sizes of rods required for automobile parts makes difficult the pre-heating processes by contact heating up to 1,000°C (Table 1). By way of comparison, the same data are presented for the induction heating process (Table 2). But here also the number of inductors (17 to 37), through which the upsetting machine is pushing the rod (Fig. 2), is high and the setup requires large dimensions. This was noticed in the Moscow Automobile Plant imeni Likhachev, while the Pervyy gosudarstvennyy podshipnikovyy zavod (First State Ball-Bearing Plant) has successfully tried a setup of smaller dimensions. The author sets forth general principles on

Card 1/2

113-58-7-15/25

High-Speed Induction Heating of Rods in Automatic Upsetting Presses

smaller setups.

There are 4 tables, 3 diagrams, 2 graphs and 5 Soviet references.

ASSOCIATION: Moskovskiy avtozavod imeni Likhacheva (The Moscow Automobile Plant imeni Likhachev)

1. Induction heating--Applications
2. Induction heating--Effectiveness

Card 2/2

SOV/122-58-12-20/32

AUTHORS: Shepelyakovskiy K.Z., Candidate of Technical Sciences, Entin, R.I.,
Doctor of Technical Sciences
TITLE: A New Method of Surface Contour Hardening Medium Module
Gears (Novyy metod poverkhnostnoy konturnoy zakalki
shesteren srednego modulya)

PERIODICAL: Vestnik Mashinostroyeniya, 1958, Nr 12, pp 53-58 (USSR)

ABSTRACT: Surface hardening of medium module gears made from medium carbon steel carried out by induction heating usually leads to the comparatively small teeth being hardened right through, unless induction heating is performed by the "two-frequency" method. With module 4 to 6 mm, the tooth chord is 6 to 10 mm and normal induction heating hardens the teeth right through - this method is satisfactory for gears which work without shock. For auto or tractor gears, through hardening is not satisfactory, and the hardness of the core of the teeth should not exceed 46-48 Rockwell C. With "two-frequency" heating, preliminary heating to 680° C is carried out at 1000 to 10000 c.p.s. and this is followed by final heating to hardening temperature at 150,000 to 400,000 c.p.s. for 0.6 to 1 second. This method gives an evenly distributed

Card 1/4

SOV/122-58-12-20/32

A New Method of Surface Contour Hardening Medium Module Gears

hardened zone around the periphery of the teeth, and a relatively soft but tough core, the hardness of which is controlled by preliminary heat treatment. "Two-frequency" heating demands high power and is expensive (800-1100 Kw). The authors have worked out a method of through heating gears to the hardening temperature and then quenching the surface at or about the critical rate. Since gear teeth require surface hardness of 56-62 Rockwell C, medium carbon steels could not be used if the core hardness was kept down to 45 Rc by a slow quench. Special steels were developed with low hardenability which could be quenched at a high rate with water and gave limited depth of hardness. These steels require fine Austenitic grain, limitation of the elements which encourage grain growth i.e. Mn, Cr, and Ni, and preferably addition of elements such as Ti or V which form barely soluble carbides and encourage the growth of Pearlite. The composition of three alloys with low hardenability is shown in Table 2. Figs 2,3 and 4 show hardness distribution through 12.5 mm diameter specimens for these steels, respectively, hardened

Card 2/4

SOV/122-58-12-20/32

A New Method of Surface Contour Hardening Medium Module Gears

after heating to 850°C, curves a) and to 900°C, curves b). Full lines are for samples without addition of Ti, and dotted lines with Ti added in the proportions given in Table 2. Comparison of these curves shows that reduction of Mn from 0.45 to 0.13% sharply reduces depth of hardening. Addition of Ti makes up for the effects which low Mn content would normally produce on the foregoing capabilities of the material. Table 3 gives further data on hardness at tooth surface and at its core, also the depths hardened above 55 Rc and above 45 Rc, for the three alloys given above. Table 1 shows similar measurements on specimens from normal medium carbon steel hardened under the same conditions. Gears with 4.23 module (tooth chord 6.5 mm) induction heated to 850°-900°C from special steel with 0.5 - 0.6 C, 0.1 - 0.3 Ti, and less than 0.2 Mn, less than .15 Cr, and less than 0.25 Ni, gave surface hardness 60 - 64 Rc, with depth below surface above 55 Rc from 1 to 2 mm and with core hardness 33 - 38 Rc. With normal 0.45 medium carbon steel, the surface hardness following similar treatment was 60 - 62 Rc, and the core

Card 3/4

SOV/122-58-12-20/32

A New Method of Surface Contour Hardening Medium Module Gears

hardness 55 - 58 Rc. Loads (kg) to break these teeth are given in Table 4; here the top group of figures is for normal carbon steel and the lower group for experimental steel. To enable the quenching rate to be controlled water must be sprayed at a set pressure. The induction heating and quenching rig shown in Fig 5 was constructed. The quench is controlled by relay operated magnetic valves at fixed pressure and temperature. Normal heating time to 850°C is 20 to 30 seconds. The hardened gears are tempered at 150°C for one and a half hours. Fig 7 shows a plot of the hardness over the area of a 4.23 module tooth so hardened. Fig 8 depicts the microstructure of the hardened layer at the surface, of the core, and of the material before hardening. There are 8 figures, 4 tables and 10 references (7 Soviet,

Card 4/4 2 English and 1 German).

25(1)

PLANE 1 BOOK EXPLANATION 807/1586
 Pribludicheskii spravochnik po kovo i ob'yemnyy atomovoye (Handbook on Open and Closed Die Forging) Moscow, Mashin, 1959. 966 p.
 15,000 copies printed.

Ed. (Title page): M.V. Storozhev; Ed. (Inside book): S.B. Kirsanov, Engineer; Ed. of Publishing House: S.M. Oliner, Engineer; Tech. Ed.: V.P. Solov'ov; Managing Ed. for Information Literature (Mashin): V.I. Krylov, Engineer.

REMARKS: The handbook is intended for engineers and technicians working in forging and die casting shops and in engineering design bureaus. It may also be used by teachers and students of technical schools.

CONTENTS: The handbook contains information on processes of forging and closed die forging. It is given on initial stock, heating blanks, quality inspection of forgings and their heat treatment, and on engineering characteristics of basic machinery and mechanical equipment, on die making and on technical-economic indexes and mechanical standardization. The authors state that problems of manufacture by forging and press forming which have only been discussed up to now in periodicals and special literature and literature are given in the handbook. The handbook is written in Russian. There are 200 figures, all in color.

Handbook on Open and Closed Die Forging

807/1586

Ch. V. Heating Devices for Forging
 Direct flame furnaces (A.S. Storozhev, Candidate of Technical Sciences)

Types of furnaces and range of use 143
 Relation between time of heating, dimensions of the hearth, and efficiency 143
 Fuel and combustion devices 143
 Devices for heat utilization of waste gas in heating furnaces 157
 Consumption in metal heating 157
 Electric heating devices and life of furnaces 165
 Technical Sciences 165
 Types of electric heating devices 167
 Heating blanks in electric resistance furnaces 168
 Induction heating in electric resistance furnaces 169
 Heating by the resistance method 171
 171

Ch. VI. Forging Equipment (S. V. Storozhev, Candidate of Technical Sciences)
 Pneumatic drop hammers 200
 Hydraulic drop hammers 200
 Hydraulic forging presses 201
 201
 202

Card 6/24

PHASE I BOOK EXPLOITATION SOV/5457

Nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy promyshlennosti. Sektsiya Metallovedeniya i termicheskoy obrabotki metallov.

Metallovedeniye i termicheskaya obrabotka metallov; Trudy Sektsii Metallovedeniya i termicheskoy obrabotki metallov (Physical Metallurgy and Heat Treatment of Metals; Transactions of the Section of Physical Metallurgy and Heat Treatment of Metals) no. 2, Moscow, Mashiz, 1980. 242 p. 8,000 copies printed.

Sponsoring Agency: Nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy promyshlennosti. Tsentral'noye pravleniye.

Editorial Board: G. I. Pogodin-Alekseyev, Yu. A. Geller, A. G. Babitskiy, and G. I. Shreyber, Eds. of Publishing House: I. I. Lezhichenko, Tech. Ed.: N. I. Kosol; Managing Editor: Literature on Metalworking and Machine-Tool Making: V. I. Mitin.

PURPOSE: This collection of articles is intended for metallurgists, mechanical engineers, and scientific research workers.

CONTENTS: The collection contains articles describing results of research conducted by members of NTO (Scientific Technical Society) of the machine-building industry in the field of physical metallurgy, and in the heat treatment of steel, cast iron, and nonferrous metals and alloys. No personalities are mentioned. Most of articles are accompanied by Soviet and non-Soviet references and contain conclusions drawn from investigations.

TABLE OF CONTENTS:

Blanter, M. Ye., Doctor of Technical Sciences, Professor, and L. I. Kuznetsov and L. A. Metashop, Engineers. Softening and Recrystallization Processes in Iron and Nickel Alloys	3
Trunin, I. I., Engineer. Effect of Cold-Working Conditions on the Endurance of Steel	12
Bernshtryn, M. L., Candidate of Technical Sciences, and L. V. Polyanskiy, Engineer. Effect of Cold Working on the Structure and Properties of the V12 Titanium Alloy	18
Kudin, I. N., Doctor of Technical Sciences, Professor. On the Reasons for the Improvement of Iron-Alloy Properties After High-Frequency Quench Hardening	25
Zakharova, M. I., Doctor of Physics and Mathematics, Professor. Conditions for the Sigma-Phase Formation in Alloys	39
Zakharova, M. I. Structural Transformations in Highly Coercive Alloys	52
Pogodin-Alekseyev, G. I., Doctor of Technical Sciences, Professor, and N. V. Serdyukovskiy, Candidate of Technical Sciences [deceased]. Effect of the Microstructure on the Development of Reversible Temper-Brittleness in Low-Carbon Manganese Steel	59
Pogodin-Alekseyev, G. I., Candidate of Technical Sciences, Docent. Effect of Some Metallurgical Factors on Strain Aging of Constructional Carbon Steel	67
Braun, M. P., Doctor of Technical Sciences, Professor, and E. I. Mirovskiy, Engineer. Increasing the Preheating Temperature in Forging	

23964

S/113/60/000/002/006/009
D207/D306

1.1710 also 1416, 1454, 1413

AUTHOR: Shepelyakovskiy, K. Z., Candidate of Technical Sciences

TITLE: A study of parts from steel with reduced hardenability
subjected to case hardening

PERIODICAL: Avtomobil'naya promyshlennost', no. 2, 1960, 33-36

TEXT: Together with R. I. Entin (Ref. 4: Vestnik mashinostroyeniya, no. 12, 1958) the author developed a steel of reduced hardenability suitable for gear-wheels of medium module (3-8 mm) to be subjected to induction case hardening. The chemical structure of this steel, termed ЭИ-937 (EI-937), is: 0.5-0.6% C; maximum 0.2% Mn; maximum 0.2% Si; maximum 0.15% Cr; maximum 0.25% Ni; maximum 0.04% S and P; 0.1-0.2% Ti. The sub-standard hardenability of this steel enabled a method of induction-coil hardening to be developed for medium module gear-wheels (Fig. 4). The gear-wheel (3) is heated in a ring inductor (1) powered by sound- or radio-frequency current at a low specific power (0.1-0.5 kwt/cm²) for 20-50 seconds. At the end of this heating period the wheel is lowered to the auto-

✓

Card 1/4

23954

S/113/60/000/002/006/009
D207/D306

A study of parts...

matic quenching spray (2). The water for the spray enters from the pipe (5) via the pressure equalizer (4) to ensure even quenching of the gear-wheel. Compared with cementation, the new hardening method is quicker and reduces steel costs and deformation. The rated generator power required is also 8-10 times less than would be needed for two-frequency hardening. The method ensures a high degree of tooth case hardness, strengthens the core (hardness RC 35) and requires no preliminary heat treatment. The hardness distribution throughout a tooth section can be seen from Fig. 2. Comparative tests of wheels for the 2nd and 3rd gears of the ЗИЛ-164 (ZIL-164) car prepared from 30ХГТ (30KhGT)

Card 2/4

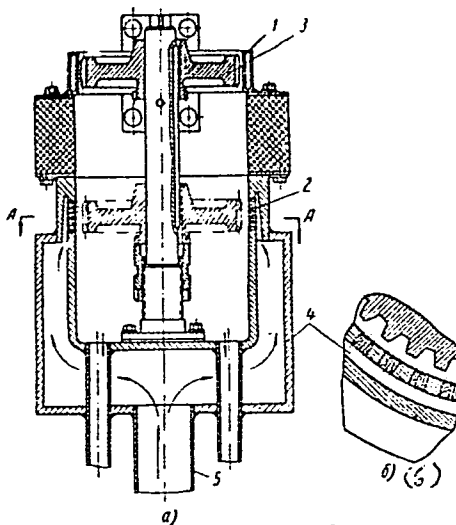


Fig. 4. Продольный (а) и поперечный (б) разрезы устройства для закалки шестерен среднего модуля из стали с пониженной прокаливаемостью.

23762

S/113/60/000/002/006/009
D207/D306

A study of parts...

Fig. 4. Legend: Longitudinal (a) and transverse (b) sections of the device for hardening medium module gear-wheels from steel of reduced hardenability.

(cementation and direct hardening) and from EI-937 (induction hardening) steels showed that the static strength of the teeth on wheels manufactured from the former was around 30% higher than on those from the latter steel. Hammer testing showed that the impact strength of gear-wheels from EI-937 steel was also much higher than those from 30KhGT steel. Further tests showed that the former are as durable as the latter. Piston pins manufactured from EI-937 steel were hardened in a water spray after through heating to 840-860°C followed by low-temperature tempering. The case had a hardness of RC 62-65 (martensite) and the core RC 30-32 (hardening sorbite). Comparative destruction tests showed that these piston pins had high endurance properties. The author also recommends the new hardening method for other branches of mechanical engineering. There are 6 figures, 4 tables and 5 Soviet-bloc references.

ASSOCIATION: Moskovskiy avtozavod im. Likhacheva (Moscow Automobile Plant im. Likhachev)

Card 3/4

A study of parts...

21364
S/113/60/000/002/006/009
D207/D306

Fig. 2. Legend: Hardness distribution throughout the section of a tooth on a gear-wheel for the second and third gears of a ZIL-164. The gear-wheel has a module of 4.23 mm with an outer diameter of 180 mm, prepared from EI-937 steel, hardened with through heating of the teeth (scale - 1 square = 1 mm).

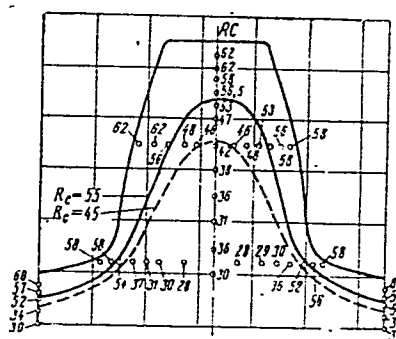


Рис. 2. Распределение твердости по сечению зуба шестерни второй и третьей передач коробки передач ЗИЛ-164, имеющей модуль 4,23 мм, с наружным диаметром 180 мм, изготовленной из стали ЭИ-937, закаленной при сквозном нагреве зуба (масштаб — 1 клетка соответствует 1 мм).

Card 4/4

S/129/60/000/012/002/013
E193/E283

AUTHOR: Shepel'kovskiy, K. Z., Candidate of Technical Sciences

TITLE: Constructional Steels of Reduced Hardenability

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1960, No. 12, pp. 8-15

TEXT: The disadvantages of case-hardening consist in that relatively expensive alloy steels have to be used and that the process itself does not lend itself easily to automation. The H.F. induction surface-hardening process is free from these disadvantages, but it cannot be applied to small components unless they are made of steel of relatively low hardenability. The object of the investigation, described in the present paper, was to acquire more experimental data on the preparation and properties of such steels. The results of the first series of experiments showed that the carbon content is not a limiting factor and that low-hardenability steels, containing 0.4-1.2% C, can be manufactured. The low hardenability is achieved by reducing to minimum the manganese, silicon, chromium, and nickel content in the steel, and by the introduction of modifying elements such as aluminium and titanium

Card 1/4

✓

S/129/60/000/011/002/015
E193/E283

Constructional Steels of Reduced Hardenability

or vanadium, niobium, tellurium, or zirconium, and by observing certain precautions during the smelting operation. One possible set of recommendations for smelting low-hardenability steels includes the following: 1 - electric arc, induction or open-hearth furnace can be used for making this type of steel, but in every case, basic lining should be employed. 2 - when scrap is used in smelting, silicon-free charge must be used. When oxygen is introduced during smelting, the nature of the charge is immaterial, but it should contain lowest possible content of elements which do not oxidize during smelting (nickel, copper). 3 - neither silicon nor chromium should be used as the oxidizing additions. 4 - since both titanium and aluminium serve as modifying elements, they should be added to the melt in quantities larger than those required for de-oxidizing the molten metal. The composition of several steels of low hardenability is given in the table reproduced below.

Card 2/4

S/129/60/000/012/002/013
E193/E283

Constructional Steels of Reduced Hardenability

Table 3

	Chemical Composition in %							
	C	Si	Mn	Cr	Ni	Ti	P	S
Experimental Steels	0.59	0.06	0.02	0.03	0.26	0.12	0.008	0.010
	0.52	0.06	0.02	0.04	0.28	0.11	0.006	0.010
Electric Arc Furnace Steels	0.57	0.18	0.05	0.05	0.13	0.11	0.015	0.015
	0.52	0.18	0.08	0.03	0.23	0.11	0.013	0.009
	0.75	0.22	0.08	0.05	0.08	0.15	0.008	0.008
Open Hearth Furnace Steels								
65Mn (65PP)	0.65	0.11	0.15	0.05	0.03	0.32	0.017	0.024
55Mn (55PP)	0.54	0.03	0.15	0.03	0.06	0.11	0.016	0.030

✓

Card 3/4

S/129/60/000/012/002/013
E193/E283

Constructional Steels of Reduced Hardenability

Depending on the composition and method of smelting, the hardenability of this type of steel is greatly affected by the quenching temperature. The critical temperature, above which hardenability rapidly increases, may vary from 800°C for an electric-arc furnace smelted (0.75% C, 0.08% Mn) steel to 1000°C for an induction furnace smelted steel containing 0.53% C and 0.02% Mn. A characteristic feature of this type of steel is a very high critical rate of cooling, which amounts to 1000-2000°C/sec as compared with 150-400°C/sec for Steel 45. The results of transverse bending tests, carried out on both case-hardened alloy steels and surface-hardened low-hardenability steels, showed that in this respect the latter equal, or even excel the former. There are 5 tables, 4 figures and 9 Soviet references.

ASSOCIATION: Moskovskiy avtomobil'nyy zavod
(Moscow Car Factory)

Card 4/4

SHEPELYAKOVSKIY, K.Z., kand.tekhn.nauk

Review of "Industrial application of induction heating" by
M.G.Loizinskii. Vest.nash. 40 no.4:86-87 Ap '60.
(MIRA 13:6)

(Induction heating) (Loizinskii, M.G.)

SHEPELYAKOVSKIY, K.Z., kand.tekhn.nauk

Effect of induction hardening on the properties of steel. Metalloved.
i term.obr.met. no.2:15-18 F '62. (MIRA 15:3)

1. Moskovskiy avtomobil'nyy zavod imeni Likhacheva.
(Induction hardening) (Steel--Testing)

SHEPELYAKOVSKIY, K.Z., kand.tekhn.nauk

Surface hardening of rear-axle gears made of 55PP low-hardenability
steel. Avt.prom. 28 no.10:39-41 O '62. (MIRA 15:9)

1. Moskovskiy avtozavod im. Likhacheva.
(Steel--Hardening)

SHEPELYAKOVSKIY, K.Z., kand.tekhn.nauk; ZELENova, V.D., kand.tekhn.nauk;
OSTROVSKIY, G.A., inzh.

Structure and properties of an induction-hardened layer of steel.
Metalloved. i term. obr. met. no.9:24-29 S '62. (MIRA 16:5)

1. Moskovskiy avtomobil'nyy zavod (ZIL) i Gosudarstvennyy soyuznyy
ordena Trudovogo Krasnogo Znameni nauchno-issledovatel'skiy
avtomobil'nyy i avtomotorny institut.
(Steel—Metallography) (Induction hardening)

S/276/63/000/002/010/052
A052/A126

AUTHOR: Shepelyakovskiy, K.Z.

TITLE: Case hardening of rear axle gears made of 55Mn(55PP) of low hardenability

PERIODICAL: Referativnyy zhurnal, Tekhnologiya mashinostroyeniya, no. 2, 1963, 54-55, abstract 2B228 (Avtomob. prom-st', no. 10, 1962, 39-41)

TEXT: At the Moscow automobile plant imeni Likhachev a new technological process was introduced for case hardening of rear axle cylinder-driven gears made of 55PP steel of low hardenability. The process is realized through induction heating. The elements to be hardened are heated to the hardening temperature by control or valve generators of standard 60-100kw. The hardening is done by means of appliances securing intensive and regular water cooling of the hardened surface. The surface of the element is hardened to the depth of 1-2mm to RC 58-62 hardness. The hardness of the core is RC 30-40. An automatic installation for the outline hardening of cylindric rear axle gears is described. The installation can

Card 1/2

S/276/63/000/002/010/052
AO52/A126

Case hardening of rear axle...

be used for gears 200-450mm in diameter. The technical and economic effectiveness of this process consists essentially in cutting the steel costs, the consumption of alloying elements, the heat treatment costs (approx. by 2/3, in the possibility to automate the process of heat treatment, in reducing deformations during heat treatment and, as a result, in increasing the precision of gearing. There are 4 figures and 9 references.

T. Kislyakova

(Abstracter's note: Complete translation.)

Card 2/2

L 10690-63

EWP(q)/EWT(m)/BDS--AFFTC/ASD--JD

S/0129/63/000/006/0030/0035

ACCESSION NR: AP3001653

54

AUTHOR: Zelenova, V. D.; Ostrovskiy, G. A.; Shepelyakovskiy, K.Z.

TITLE: Growth of austenitic grain in steel during induction heating

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 6, 1963, 30-35

TOPIC TAGS: austenitic grain, steel, induction heating, martensite steel, austenite steel

ABSTRACT: The initial austenitic grain, whose size depends on the dispersibility of the original structure, determines the grain size of steel made by induction heating. The rate of heating, from 8 to 1000 degrees per second does not affect size of the original grain; but further austenite growth depends on heating rate, slow rate and high temperature causing grain growth. Decreasing austenite grain size from No. 8 to 12 decreases roasting and increases strength of martensite steel. Use of inherently fine grained steel permits an extension of the temperature interval and induction heating rate in which fine austenitic grain can still be obtained. Use of fine grained

Card 1/2

L 10690-63

ACCESSION NR: AP3001653

steel and of optimal inductive heating rates are the essential means for increasing the strength of machine parts. Orig. art. has: 3 tables and 6 figures. 0

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 09Jul63

ENCL: 00

SUB CODE: 00

NO REF SOV: 010

OTHER: 003

ja/

Card 2/2

SHEPELYANOVSKIY, K.V.:

Effect of the rate and temperature of induction heating on the
properties of hardened steel. Metalloved. i term. obr. met. no.8:
48-52 Ag '65. (MIRA 18:9)

1. Moskovskiy avtomobil'nyy zavod.

L 36090-66 EWT(m)/T/ENP(t)/ETI I/P(c) JD

ACC NR: Ar6016592

(A, N)

SOURCE CODE: UR/0129/66/000/005/0033/0037

AUTHORS: Shepelyakovskiy, K. Z.; Shklyarov, I. N.; Kal'ner, V. D.

Org: Moscow Automobile Works (Moskovskiy avtomobil'nyy zavod)

TITLE: Case hardening with deep induction heating--a promising method for heat treatment of steels

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 5, 1966, 33-37

TOPIC TAGS: case hardening, fatigue strength, tempering, steel, induction hardening, carbon steel/ 45RP steel, 47GT steel, 45G steel, 40KhGRT steel, 55PP carbon steel

ABSTRACT: A new method of case hardening with deep induction heating is described. This method was developed at the Central Scientific Research Institute of Ferrous Metallurgy (TsNIIChMet). The specific power is 0.05--0.2 kW/cm²; the heating rate in the area of phase transitions is 2--10 deg/sec; and the heating time is 20--100 sec. Steel 55PP of reduced hardenability and steel 45RP of regulated hardenability are used. It was found that the strengthened core increases the strength of the part, the thinner the hardened layer. Case-hardened 45RP steel was used for the differential axles of ZIL-130 automobiles (see Fig. 1). The hardening temperature was about 900C for 70 sec. The axles were then tempered at 250C for 1.5 hrs. The method has substantial advantages over straight-through heat treatment and conventional case

Card 1/2

UDC: 621.78.5

SHEPELYUK, S., raskryazhevshchik

Bucker works without a marker. Mast.lesa no.5:1-3 My '57.
(MIRA 10:10)

1.Nagorskiy lesopromkhoz.
(Lumbering)

S/194/62/000/001/055/066
D201/D305

9.2510

AUTHORS: Kossov, O. A. and Shepenina, R. F.

TITLE: Phase-controlled switching transistor power amplifiers

PERIODICAL: Referativnyy zhurnal, Avtomatika i radioelektronika,
no. 1, 1962, abstract 1-7-185s (Vestn. elektropromisti,
1961~~32~~no. 7, 52-58)

TEXT: Phase-controlled power amplifiers using switching transistors are considered. These a.c. supply amplifiers permit the design of either balanced or unbalanced output d.c. or a.c. circuits, operating as switches and which produce a wide range of smooth load voltage variations. The requirements for an arrangement controlling the angle switching-in are considered, together with possible variants of the amplifiers and the comparative analysis of their characteristics. The working of the possible amplifier circuits into different loads is analyzed. It is shown that the considered amplifier circuits consist actually of 3 stages (PA - multivibrator - output stage); each stage has a considerable gain, but only the PA intro-

Card 1/2

SHEPER, M., inzh.-mayor

Flight testing of an airplane. Av. i kosm. 46 no.12:71-73
D '63. (MIRA 17:1)

USSR/Cultivated Plants - Grains.

M-2

Abs Jour : Ref Zhur - Biol., No 7, 1958, 29746

Author : Nevskiy, S.P., Sheperin, G.P.

Inst : Stavropol Scientific Research Institute for Agriculture.

Title : The Hydromodulus of Constantly Flooded Rice in Stavropol'skiy Kray.

Orig Pub : Byul. nauchno-tekhn. inform. Stabrop. n.-i. in-ta s.kh., 1956, No 1-2, 61-63.

Abstract : In order to determine the hydromodulus and actual irrigation rate of constantly flooded rice the Stavropol Experimental Melioration Station set up a fixed series of observations on steppe and bottom land soils. Their hydrophysical properties are characterized. Both during the flooding period and at the time of the supporting water layer the irrigation rates are higher on steppe soils

Card 1/2

APPROVED FOR RELEASE: 07/13/2001

CIA-RDP86-00513R001549110011-8

USSR/Cultivated Plants - Grains.

M-2

Abs Jour : Ref Zhur - Biol., No 7, 1958, 29746

than on bottom land. It is recommended that constantly flooded rice plantings in Stavropol'skiy Kray be primarily situated on bottom land and higher flood land terraces having heavy, weakly filterable soils.

Card 2/2

L 28527-66

ACC NR: AP6012333

(A)

SOURCE CODE: UR/0317/65/000/006/0058/0033

AUTHOR: Volgin, M. (Major general in technical engineering service, ²⁰
Candidate of technical sciences); Shepet, P. (Engineer, Colonel) ^B

ORG: None

TITLE: A company training target complex

SOURCE: Tekhnika i vooruzheniye, no. 6, 1965, 58-63

TOPIC TAGS: ground force training, gunnery training, fire control equipment

ABSTRACT: A new fire control target system used by the Army Ground Forces at their various firing ranges is described. The target system was designed for military units of a company size undergoing training in firing practice. The system consisted of 86 automatic targets controlled by radio. The radio electric equipment included a control desk, four distribution panels, three signal imitators, 17 storage batteries, and insulated cables. The total weight of the equipment was about 4.5 tons. It was transported by two motor vehicles. A platoon can install the system in 6 to 8 hours and remove it in about 3 hours. The system (in four areas) is controlled by one transmitting and four receiving

Card 1/2

L 28527-66

ACC NR: AP6012333

0

radio stations. The control desk regulating the radio transmission is fed from a 12-v battery while 12, 24, and 48 volts are needed for distribution panels controlling the receiving stations. The target device of AML-T48 type was described and illustrated. The dropping, lifting, and releasing of targets hit during the exercises was explained by means of three circuit diagrams. The first diagram showed the electric circuit of the AML-T48 target, the second one depicted the electronic circuit of the control desk and the third diagram represented the receiving circuit of the distribution panel. The use of radio remote control was explained and a graph showing the variation of voltages and frequencies (carrier and operating) in time was presented. A light signal imitator was designed for "cannon" and "rifle" operations.

SUB CODE:19, 09/ SUBM DATE: None

Card 2/2 00

LAZEBNAYA, G.V., SHEPETA, N.G.; KUSTAS, V.L.

Flame photometric determining of potassium, cesium and rubidium when
present together. Prom.khim.reak. 1 osobo chist.veshch. no.2:70-74
'63. (MIRA 17:2)

1. The first part of the report

2. The second part of the report

3. The third part of the report, which is a detailed description of the system, is divided into two parts, the first part, which is a description of the system, and the second part, which is a description of the system.

4. The fourth part of the report, which is a description of the system, is divided into two parts, the first part, which is a description of the system, and the second part, which is a description of the system.

SHEPETINA, F. A., Candidate Agric Sci (diss) -- "The effect of phosphorebacterin and azotobacterin on the growth, development, and yield of sunflower and clover". Voronezh, 1959. 20 pp (Min Agric USSR, Voronezh Agric Inst), 150 copies (KL, No 23, 1959, 170)

SHEPETINA, F.A., kand.sel'skokhoz.nauk; ZATUCHNYY, V.L.; LOVYANNIKOV, P.T.

Prospective methods for cultivating oil-bearing roses. Masl.-
zhir. prom. 27 no.2:35-36 '61. (MIRA 14:2)

1. Moldavskaya zonal'naya opytno-selektсионnaya stantsiya Vsesoyuznogo
nauchno-issledovatel'skogo instituta maslichnykh i efiromaslichnykh
kul'tur;

(Roses)

U.S.S.R., .. Industrial, M.

Efficiency, Industrial

How we achieve over-fulfillment of the norm by every worker, V per.
profaktivu, 13, no. 14, 1952.

Monthly List of Russian Accessions, Library of Congress, October 1952.

UNCLASSIFIED.

ORECHKIN, D.B.; POPOVA, N.V.; RYKOVA, I.S.; SHEPET'KO, O.F.; Prinimali
uchastiye: BURKOVA, A.P.; MIKHAYLOVA, N.V.

Preparation of alkylaryl sulfonates from straight-run oil
fraction. Khim.i tekhn.topl.i masel 8 no.1:27-30 Ja '63.
(MIRA 16:2)

(Petroleum--Refining) (Sulfonic acids)

1.
2. ... (60)
4.
7. Defects in the construction part of the plan, Malch. ... 14 No. 4, 1953.

9. Monthly List of Russian Accessions, Library of Congress, June 1953, Unclassified.

SHEPERDOV, R.V., LOKITY NSK YA, D.A., TROITSKAYA, Y.A., ROMITYANSKY, I.I.,
and ZYBIN, K.VI.,

"The Fine Structure of Magnetic Storms with Respect to Pulsations
with Periods less than 15 sec,"

report presented at the Intl. Conference on Cosmic Rays and
Earth Storms, Kyoto, Japan, 4-15 Sept 1961.

SHEPETNOV, R.V., ROKITYANSKAYA, D.A., TROITSKAYA, V.A., ROKITYANSKY, I.I.,
and ZYEIN, K.YU.,

"The Connection of Pc and Pt Pulsations with Magnetic Storms,"

report presented at the Intl. Conference on Cosmic Rays and
Earth Storms, Kyoto, Japan, 4-15 Sept 1961.

SHEPETOV, A.M.
 EPITOANYANO
 BUILDING MATERIALS
 Vol. 11.-1950
 No. 11-12, Nov.-Dec.

1. M. Shpetov
 Utilization of plastic slag cements in the
 production of slag concrete stones (from
 the Russian)

ASP-51A METALLURGICAL LITERATURE CLASSIFICATION
 13000 13001000
 13000 13001000
 13000 13001000

100-100000-100000
100-100000-100000

"Ispol'zovaniye Pylevichnoy Zoly Dlya Betonov i Stroitel'nykh Rastvorov. V Kontse Tre't'ego Razdela Dan Obzor Dokladov Po Voprosu Shlakozoloispol'zovaniya, Proceedings of a Conference on Problems of Ash Removal, ash and slag removal and ash and slag utilization, Trudy Konferentsiya Po Voprosam Zolculavlivaniya Shlak-zolculavlivaniya i Shlakozoloi spol'zovaniya. U.S.S.R. Gozenergoizdat (Moscow: Gozenergoizdat, 1955, 106pp.; abstr. in Teploenergetika (heat Power Engng, Moscow). June 1956, (4). There are ten papers on atmospheric pollution, flue gas cleaning; cyclones, instrumentation, pneumatic removal ash, ash handling, and the use of ash for heat insulation and construction.

SHEPETOV, A.S.; BOBORYKO, I.I.

Conducting practical courses in machine-shop practice and electricity.
Fiz. v shkole 16 no.2:59-69 Mr-Apr '56. (MLRA 9:6)

1.1-ya srednyaya shkola, g. Noginsk Moskovskoy oblasti.
(Machine-shop practice) (Electricity--Study and teaching)

BOBORYKO, I.I.; SHEPETOV, A.S.

Organizing an electric engineering study center. Politekh.
obuch. no.2:71-76 F '58. (MIRA 11:1)

1.Srednyaya shkola No.1 g. Noginska.
(Electric engineering--Study and teaching)

SHEPETOV, A.S.; RASIN, M.A. (Noginsk)

Experience in the use of a mathematics laboratory. Mat. v shkole
no.5:48-52 S-0 '59. (MIRA 13:2)
(Mathematics--Study and teaching)

SHEPETOV, M. F.

7879. Andreyev, YE. N. I SHEPETOV, M. F. Vliyaniye zhlischnykh I bytorykh usloviy na zaboilevayemost' tuberkulezom. Pod Red. D. M. Krylova. yakutsk, yakutknigoizdat, 1954. 20 S.; 4 otd. L. chert. 20 sm. (dom san. prosveshcheniya M-Va zdravookhraneniya yassr). 4.000 EKZ. Bespl.--NA Yakut. Yaz.--(55-630) P

616.995

SO: Knizhuaya Letopis', Vol. 7, 1955

KORZINNIKOVA, A.I.; SHEPETOV, M.F., kand.med.nauk

Some forms of health education and their connection with the
movement for health information in the Yakut A.S.S.R. Zdrav.
Ros.Feder. 3 no.9:16-20 S '59. (MIRA 12:11)
(YAKUTIA--HEALTH EDUCATION)

ANDREYEV, Ye.N., kand.med.nauk; SHEPETOV, M.F., kand.med.nauk

Current state of antituberculosis aid in the Yakutsk A.S.S.R. Sov.med.
23 no.8:127-132 Ag '59. (MIRA 12:12)

1. Iz Yakutskogo filiala (dir. Ye.N. Andreyev) Instituta tuberkuleza
Akademii meditsinskikh nauk SSSR.
(TUBERCULOSIS prev. & control)

S/194/62/000/005/079/157
D222/D309

AUTHOR: Shepetov, V.N.

TITLE: Standardization and normalization of ultrasound apparatus

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 5, 1962, abstract 5-5-34 t (V sb. Prom. primeneniye ul'trazvuka. Kuybyshevsk. aviats. in-t. Kuybyshev, 1961, 5-13)

TEXT: In the GOST project for the standardization and normalization of ultrasound apparatus it is recommended that, in accordance with GOST, a series of preferred input power levels for ultrasound generators in the range 0.04 - 250 kW should be established for the following frequencies: 20, 40, 200, 400, 800 and 1600 kc/s; these numbers also forming a GOST series. The recommended generator power is tabulated according to the frequency. [Abstractor's note: Complete translation]. ✓

Card 1/1

SHEPETOVA, I.M., arkhitektor

Designing wall profiles based on the standardized assortment
of large blocks. Nov.v stroi.tekh. no.13:189-200 '59.
(MIRA 13:4)

(Walls) (Concrete blocks)

YABLONSKIY, D.N., kand.arkhitektury; SHEPETOVA, I.M., arkhitektor;
MEDVEDEV, M.I., inzh.

Numerical foundation of a series of derivative moduli. Izv.
ASIA 4 no.2:77-81 '62. (MIRA 15:9)
(Modular coordination (Architecture))

SHEPETOVSKAYA, I. P.

SHEPETOVSKAYA, I. P.: "Class work associated with the teaching-learning process in the ancient-history course in the fifth and sixth classes of secondary school". Moscow, 1955. Min Education RSFSR. Moscow City Pedagogical Inst imeni V. P. Potemkin, Chair of History Methodology and the USSR Constitution.
(Dissertation for the Degree of Candidate of Pedagogical Sciences)

SO: Knizhnaya Letopis' No. 51, 10 December 1955

ACCESSION NR: AR4041592

S/0137/64/000/005/D037/D037

SOURCE: Ref. zh. Metallurgiya, Abs. 5D220

AUTHOR: Kovalevskiy, N. G.; Yushkevich, P. M.; Shepetovskiy, A. Ya.

TITLE: Cold processing and heat treatment of pipes of steel SN2 (EI904)

CITED SOURCE: Sb. Proiz-vo trub. Vy* p. 10. M., Metallurgizdat, 1963, 50-57

TOPIC TAGS: cold processing, heat treatment, steel pipe/SN2 steel

TRANSLATION: Investigation was conducted on billet shells with dimensions 41 by 3.5 by (1100 - 1200) mm, obtained by hot pressing of steel of grade SN2 (0.05-0.06% C, 0.28-0.31% Mn, 0.42% Si, 7.9-8.1% Ni, 16-16.1% Cr, 1.06-1.12% Al, traces of Ti). Results of mechanical tests of steel samples SN2 after normalization, the course and technological parameters cold rolling and drawing of steel pipes SN2 are listed. It was determined that cold rolling and drawing of steel pipes SN2 can be carried out normally with deformations close to

Card 1/2

ACCESSION NR: AR4041592

deformations allowed during rolling and drawing of steel 1Kh18N10T. Heat treatment of steel SN2 should be conducted at 1100° and holding for 5 minutes with cooling in air. In process of cold rolling and drawing of pipes of steel SN2 martensite of deformation will be formed, which strengthens metal in addition to strengthening caused by curshing of substructure of austenitic matrix.

SUB CODE: MM

ENCL: 00

Card 2/2

ACCESSION NR: AR4041539

S/0137/64/000/004/DO44/DO44

SOURCE: Ref. zh. Metallurgiya, Abs. 4D259

AUTHOR: Yushkevich, P. M.; Kovalevskiy, N. G.; Shepetovskiy, A. Ya.

TITLE: Phase hardening of stainless steel EI904 (1Kh15N9Yu) during cold drawing and rolling

CITED SOURCE: Sb. Proiz-vo trub. Vy'p. 11. M., Metallurgizdat, 1963, 100-103

TOPIC TAGS: Phase hardening, cold drawing, cold rolling, stainless steel/
EI904 steel

TRANSLATION: For study of hardening of steel EI904 from a forged rod there was prepared shells of dimension 27 x 2.5 x 300 millimeters with turned external and reamed internal surfaces. Shells were rolled on a laboratory two-high mill 200 in rollers with variable section of stream (principle of pilger rolling) on a conical mandrel. The initial billet in experiments of drawing was a pipe of dimension 20 x 1.25 millimeters, obtained from a shell by cold rolling. All shells and pipe before cold deformation were subjected to normalization at 1100° with holding

Card 1/3

ACCESSION NR: AR4041539

for 10 minutes. After normalization these shells were subjected to etching in a solution of hydrofluoric acid; then before cold rolling their surface was coated with oxalate. In process of investigation they studied influence of degree of cold deformation by rolling and drawing (from 5 to 70%) on mechanical properties of pipes, where it was, planned to conduct deformation of pipes by mandrel-less drawing within 5-40%, and cold rolling—within 30-70%. During drawing the following degrees of deformation were obtained: 5, 10, 15, 20, 30 and 37%, during rolling—32, 40, 43, 45, 58, 52, 58 and 68%. With increase of degree of deformation of rolling >30-40% there is observed gradual increase of σ_s ; with deformation of 68% it attains 145-152 kilograms per square millimeter. σ_s here remains approximately on the same level (125-130 kilograms per square millimeter), and δ decreases from 13 to 5%. Increase of degree of hardening of the metal after tempering and deformation is more than 10%, caused by the fact that steel EI904 consists mainly of unstable martensite of deformation, which during tempering endures precipitation hardening. This is confirmed by decrease of period of the crystal lattice of martensite during tempering up to 500° from 2.864 to 2.855 Å. Tempering of cold-rolled pipes at 400° leads also to insignificant change of mechanical properties. σ_s in this case increases by 10 kg/mm², $\sigma_{0.2}$ by 3-4%, and

Card 2/3

ACCESSION NR: AR4041539

δ decreases by 1-4%. The basic difference of influence of tempering on mechanical properties of cold-rolled and cold-drawn pipes is the fact that in cold-rolled pipes after tempering δ decreases, and in cold-drawn it increases. This once again confirms opinion that the character of deformation (drawing and rolling) essentially affects mechanical properties of pipes, and to a significant extent this influence is hereditarily transmitted to steel in the process of tempering.

SUB CODE: MM

ENCL: 00

Card 3/3

L 41361-65 EWP(k)/EWP(z)/EWA(c)/EWT(d)/EWT(m)/EWP(h)/EWP(b)/T/EWA(d)/EWP(l)/EWP(w)/
EWP(v)/EWP(t) Pf-4 MJW/JD/HW S/0137/64/000/008/I039/I040 37
ACCESSION NR: AR5000589 33

SOURCE: Ref. zh. Metallurgiya. Sv. t., Abs. 8D230 B

AUTHOR: Chepurko, M. I.; Kovalevskiy, N. G.; Yushkevich, P. M.;
Verkhovod, V. K.; Shepetovskiy, A. Ya.

TITLE: Production of pipes from high strength stainless steel
Kh17N5M3 4

CITED SOURCE: Sb. Proiz-vo trub, vy*p. 12. M., Metallurgiya, 1964,
44-51

TOPIC TAGS: pipe, stainless steel, metal ductility, drawing
steel Kh17N5M3, steel Kh18N10T 6

TRANSLATION: To determine the ductility of steel Kh17N5M3, samples were subjected to hot torsion and piercing tests according to the method of the Ukrainian Pipe Research Institute. The torsion tests were carried out at 975-1225°, the piercing tests at 950-1250°, with a shrinkage of 1.6-15.5%. The data obtained show that the steel investigated has the highest ductility in the interval 1150-1250°.

Card 1/3

L 41361-65

ACCESSION NR: AR5000589

5

Comparison of test results for hot torsion of steel Kh17N5M3 and steel Kh18N1OT, which is widely used in pipe production, show that the former is characterized by a considerable lower ductility than the latter, and that the former is consequently related to the low ductility difficult drilling steels. It was established by an investigation of the microstructure of steel Kh17N5M3 under different heating conditions (from 1000 to 1350°) that the quantity of ferrite in the steel increases starting with 1200° but that grain boundary fusion takes place only at 1340-1350°. Pipes with dimensions 20 x 1.5, 18 x 1, and 12 x 1 mm made of Kh17N5M3 were prepared by hot pressing tubular billets on a vertical hydraulic 600 ton press with subsequent rolling on cold rolling mills (KhPT-75 and KhPTR-15-30) and drawing on drawing mills. To reduce cold hardening of the metal after pressing, conditions for normalizing were worked out. A mixture of castor oil (70%) and talc (30%) was used as a lubricant in rolling on mill KhPT-75 and castor oil was used for rolling mill KhPTR-15-30. Rolling of pipes with dimensions 25 x 2.5 mm proceeded in a satisfactory manner. An attempt to roll pipes with dimensions 25 x 2 mm, that is, with a higher degree of deformation (86%), was not crowned with success since the mandrel failed because of the

Card 2/3

L 41361-65

ACCESSION NR: AR5000589

considerable increase in the load on the working instrument. To alter pipes with dimensions of 23 x 1.95 mm and 20 x 1.45 mm, parts were rolled into pipes with finished dimensions of 20 x 1.5 and 18 x 1 mm. To decrease bending, the drawing was done through two draw plates at the same time. The diameter of the intermediate draw plate used in drawing full size pipes with dimensions 18 x 0.98 was 16 mm, but in drawing from dimensions 14.5 x 0.98 mm to finished dimensions of 12 x 1 it was 13 mm. During this process pipes with dimensions of 14.5 x 0.98 mm were not subjected to hot working before drawing. The lubricant for them was the oxalate film which they retained from the coating received before the first drawing. Cold rolling of such pipes is feasible with consecutive deformations up to 60%, but rolling is feasible with only a single deformation up to 30%. Heat treatment of full size pipes made of the steel under investigation should be carried out at 1100-1150° with air cooling. K. Ursova

SUB CODE: MM

ENCL: 00

cc
Card 3/3

SHAPOVALOV, N.A., inzh.; SHEPETUKHA, M.G., inzh.; DYMSHITS, M.A., inzh.;
SOLODKIY, Z.P., inzh.

Organizing the repair and modernization of industrial equipment
in the enterprises of the Ukrainian S.S.R. Mashnistroenie no.6:
5-3 N-D '64 (MIRA 18:2)

BUKHANTSEV, A.N., knad.tekhn.nauk; TISHCHENKO, V.V., inzh.; SHEPETUKHA, M.I.,
inzh.

Study of the operation of a boiler unit of the OPI-DIR system.
Izv. vys. ucheb. zav.; energ. 5 no.9:122-125 S '62. (MIRA 15:10)

1. Odesskiy politekhnicheskii institut.
(Boilers)

SHENKIN, I. A.; SHENKINA, A. F.

Boots and Shoes - Trade and Manufacture

Attaching soles with vinyl perchloride cement.

Leg. prom. 12, No. 4:36-37, April 1952.

9. Monthly List of Russian Accessions, Library of Congress, July 1952. UNCLASSIFIED.

SHEPETYA, V.A.

Training of mechanization specialists. Put' i put. khoz. 7
no.11:22 '63. (MIRA 16:12)

1. Glavnyy mekhanik Putevoy mashinnoy stantsii No.90, Yelgava,
Pribaltiyskoy dorogi.

MATORINA, N.N.; CHMUTOV, K.V.; SAFONOVA, N.D.; SHEPETYUK, L.V.

Kinetics of ion exchange processes in the presence of complex-forming reagents. Dokl. AN SSSR 152 no.4:915-918 0 '63.
(MIRA 16:11)

1. Institut fizicheskoy khimii AN SSSR. 2. Chlen-korrespondent AN SSSR (for Chmutov).

L 21331-65 EWT(m)/EWP(j) Pc-4 AFWL/AEDC(a)/SSD/AS(mp)-2/AFETR/ESD(gs)/
ESD(t) RM

ACCESSION NR: AP4044437

S/0076/64/038/008/1942/1949

AUTHOR: Matorina, N. N. (Moscow); Chmutov, K. V. (Moscow); Safonova, N.D.
(Moscow); Shepetynk, L. V. . B

TITLE: Effect of kinetic factors on the formation of diffuse zones in the complex-
ation ion-exchange chromatography ¶

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 8, 1964, 1942-1949

TOPIC TAGS: cationite, ion exchange, column chromatography, complexation,
diffusion, cerium, europium

ABSTRACT: The article considers the results of the study of separation of rare
earths by EDTA and citrate solutions. All studies were carried out at very small
adsorption of rare earths on cation exchange resins (less than 1%). Columns
were thermostatted to $\pm 1^\circ\text{C}$. Each column contained 2 g of cation exchanger KU-2
(8-10% divinylbenzene). The investigated rare earth elements Ce^{144} , Pr^{144}
and Eu^{152} , 154 were adsorbed from 0.1 N HCl or HNO_3 solutions in a narrow
layer of cationite in H-form in the upper part of the column. The sorbed rare

Card 1/2

L 21331-65

ACCESSION NR: AP4044437

earths were eluted with complexing agent solutions at definite and constant pH values. The concentration of rare earth elements were determined radiometrically. It has been found that diffuse spreading of zones is due to gel and film kinetics. Complexation kinetics in the solution have no appreciable effect. The main reason for the difference in zone spreading during elution of rare earth elements with EDTA and H_3Cit is the difference in the rate of interdiffusion processes. The possibility is considered for using equations of Tumitskiy, Glueckauf and Bressler for the determination of the degree of spreading of zones. It has been shown that in order to compare the experimental and theoretical results, diffusion coefficients must be employed which are determined by an independent method under the same conditions of elution. Orig. art. has: 7 figures and 2 tables

ASSOCIATION: Institut fizicheskoy khimii AN SSSR (Institute of Physical Chemistry, AN SSSR)

SUBMITTED: 20Jul63

NR REF SOV: 004

ENCL: 00

OTHER: 003

SUB CODE: GC

Card 2/2

SHIBKOV, A.A., polkovnik meditsinskoy sluzhby; SHEPILEVICH, V.F.

Women physicians as guardians of the health of Soviet troops.
Voen.-med.zhur. no.3:7-9 Mr '61. (MIRA 14:7)
(MEDICINE, MILITARY) (WOMEN AS PHYSICIANS)

PSYCHIATRY

HUNGARY/UNITED KINGDOM/SWITZERLAND

VARGA, Ervin, Dr., Candidate, Holder of a WHO Scholarship, ANGST, Jules, Professor, Dr., and SHEPHERD, Michael, Professor, Dr., Psychiatric Clinic at the Medical University (Orvosegyetem Psichiatriai Klinika) in Budapest; Psychiatric Clinic at the University in Zurich, Switzerland; and Institute for Advanced Psychiatric Studies at the University in London, United Kingdom.

"Evaluation of Treatments for Depression (Comparative, Retrospective Analysis)"

Budapest, Ideggogyaszati Szemle, Vol 19, No 6, Jun 1966, pp 169-171.

Abstract: This report is part of the International Study of Depression conducted simultaneously in Hungary, United Kingdom, and Switzerland and describes an analysis of 910 patients treated in Maudsley and Bethlem hospitals in the United Kingdom according to the methodology described in Brit. Med., 1965, No 1, pp 881-886 [author's name not given]. The summary discussed has been obtained by mechanical processing of the clinical data. One reference to a Western publication. (Manuscript received Dec 1965 [day of the month not given]).

1/1

VERBIN, D.S., inzh.; SHEPIL'EVSKIY, V.M., inzh.

Automatic welding of the diaphragms of steam turbines in
a carbon dioxide medium at Leningrad Metalworking Plant.
Energomashinostroenie 6 no.7:29-31 J1 '60.
(MIRA 13:7)

(Leningrad--Steam turbines)
(Gas welding and cutting)

2828 Shepilo, I. N.

Vliyaniye bolovykh i snitovidnykh znelez na sekrogoronuyu deyatel'nost'
zhelir'ka (pavlovskiy zheludocnek) v usloviyakh ikh vzeitodeystviya. Rostov
n/D, 1954. 16 s. 20 sm. (rost. gos. un-t im. V. m. Molotova). 106 Ecz. B.
ts. - (54-51780)

SHEPILOV, A.Ya.

Servicing electric locomotives with shift teams. Elek.i
tepl.tiaga 4 no.1:18-19 Ja '60. (MIRA 13:4)

1. Glavnyy inzhener lokomotivnogo depo Moskva III.
(Electric locomotives--Maintenance and repair)

ШЕПИЛОВ, Д. Т.

Shepilov, D. T. Stalinskiy ustav sel'skokhozyaystvennoy arteli-osnovnoy zakon kolhoznogo stroya. Moskva, Vsesoyuznoye lektсионnoye byuro pri minist-rstve vyshego obrazovaniya SSSR, 1946. 23 p. (Stalin regulation on agricultural artels - the basic law of kolkhoz structure.)

SHCHERBOV, D. P., LENT'YANOV, L. A., LAFEEV, I. D., KUZ'MINOV, I. I., GATOVSKIY, L. M.
and GOROVITYANOV, K. V.

"Political Economy," textbook, State Publishing House of Political Literature, Moscow, 1954.

SHEFILOV, D

KFP
.R92132

PECHAT'V BOR'BE ZA DAL' NEYSHY POD" YEM SEL'SKOGO KHOZYAYSTVA. MOSKVA,
GOSPOLITIZDAT, 1954.

63 P. (V POMOSH' RABOTNIKAM PECHATI)

BIBLIOGRAPHICAL FOOTNOTES.

RUSSIA

SHEPILOV, D

T

EPF
.R93258

Tvorit' Dlya Blaga I Schast'ya Naroda (To Create for the Welfare and Happiness of the People) Moskva, Gospolitizdat, 1957.

35 p.

SHEPILOV, DMITRI TROFIMOVICH

N/5
122.1
.S5

Voprosy Mezhdunarodnogo polozheniya i vneshney politiki Sovetskogo Soyuza
(Problems of the International Situation and Foreign Policy of the Soviet
Union) Moskva, Gospolitizdat, 1957.
45 p.

122.1
114.48

N/5
N/5

MEA

1955, No. 26, June 1955, Moscow
Kalinina, N. N. - "Investigation of the Process of Grinding Gear Teeth on Machines
Driven on Arched Iron-in Mechanism and Operating with a Disk Circle." Min of Higher
Education USSR, Moscow Order of Lenin Aviation Inst named Sergey Zhukovskiy, Moscow, 1955
(Disputations for Degree of Candidate of Technical Sciences)

55: Kalinina, N. N. No. 26, June 1955, Moscow

L 31364-66 EWP(j)/EWT(m) IJP(L) RM
 ACC NR: AP0021104 SOURCE CODE: UR/0062/66/000/002/0384/0384
 AUTHOR: Gubin, S. P.; Shepilov, I. P.; Nesmeyanov, A. N.
 ORG: Institute of Organoelemental Compounds, AN SSSR (Institut elementoorganicheskikh soyedineniy)
 TITLE: Acetylation of ferrocene by the complex $2\text{CH}_3\text{COOH} \cdot \text{BF}_3$ sub 3
 SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 2, 1966, 384
 TOPIC TAGS: ferrocene, acetylene compound, reaction rate, activation energy, spectrophotometric analysis, catalysis, chemical reaction kinetics
 ABSTRACT: The authors determined rates of acetylation of ferrocene by the complex $2\text{CH}_3\text{COOH} \cdot \text{BF}_3$ in glacial acetic acid under pseudo-first order conditions. The reaction was arrested by pouring the sample (1 ml) into 20 ml of absolute ethanol. The ferrocene and acetylferrocene concentrations in the solution were determined spectrophotometrically at 337 millimicrons on the SF-4A unit. The apparent energy of activation is 22.4 kcal/mole. When the catalyst concentration is increased, the reaction rate rises. The data obtained shows that ferrocene is 200-300 times more active than anisole in the acetylation reaction. [JPRS]
 SUB CODE: 07 / SUBM DATE: 17Nov65 / OTH REF: 001
 Card 1/1 UDC: 542.957 + 546.72 + 66.095.11

KHRIPUNOV, A.M., inzh.; SHESTAKOV, A.D., inzh.; SHEPILOV, M.Ye., inzh.

Our method to secure an accurate performance of the regenerative braking circuit of the VL8 electric locomotive; from the practices of the Zlatoust Depot of the Southern Urals Railroad. Elek. i tepl.tiaga no.8:13-16 Ag '63. (MIRA 16:9)

1. Depo Zlatoust Yuzhno-Ural'skoy dorogi.
(Electric locomotives--Brakes)

SHUTSKAYA, Ye.I., kand. med. nauk; Prinimali uchastiye: RABINOVICH,
S.Ye., prof.; SLEPTSOVA, A.I., vrach; LIVEN, K.I., vrach;
SOKOLOVA, R.I., vrach; PEREL'MAN, R.M., vrach; AL'TMAN, I.M.,
vrach; SHEPILOV, N.S., kand. veterin. nauk; SVIRIDOV, A.A.

Epidemiological importance of tuberculosis in cattle.
Veterinariia 40 no.10:19-20 0'63. (MIRA 17:5)

1. Novosibirskiy nauchno-issledovatel'skiy institut tuberkuleza
(all except Shepilov, Sviridov).

GOLUBCHENKO, Aleksandr Ivanovich; EPEL'MAN, Tovi Yevseyevich;
Prinimal uchastiye SHEFILOV, V.A.; KURZON, A.G., retsenzent;
MIRYUSHCHENKO, A.A., retsenzent; SHAPURAK, Ye.N., red.; VASIL'YE,
L.G., nauchnyy red.; KOROVENKO, Yu.N., tekhn. red.

[Marine power plants] Sudovye silovye ustanovki. Leningrad,
Sudpromgiz, 1962. 512 p. (MIRA 15:10)
(Boilers, Marine) (Marine engines) (Marine turbines)

ZHILIN, G., laureat Stalinskoy premii; SHEPILOV, V., inzhener

Measures for increasing fire tube service in L locomotives. Tekh.
zhel.dor.7 no.7:10-12 J1'48. (MLRA 8:11)
(Locomotive--Boilers)

SHEPILOV, V.

Zhilin, G. and Shepilov, V. "Utilization and improvement of series L locomotives,"
Zh.-d. transport, 1948, No. 12, pp. 35-42

SO: U-3264, 10 April 53 (Letopis 'Zhurnal 'nykh Statey, No. 4, 1949).